```
MASLRLFSTN HQSLLLPSSL SQKTLISSPR FVNNPSRRSP IRSVLQFNRK PELAGETPRI    60
.......... .......... .......... .......... MVFSTGNGNG DDNSKGLERV    20
.......... .......... .......... .......... .......... ......MNRI     4
........ .......... .......... .......... .......... . ......MARI     4

VVITSGKGGV GKTTTTANVG LSLARYGFSV VAIDADLGLR NLDLLLGLEN RVNYTCVEVI   120
IVITSGKGGV GKTTTTANLG MSIARLGYRV ALIDADIGLR NLDLLLGLEN RVLYTAMDIV    80
IVVTSGKGGV GKTTTTANLG AALARLGKKV VLIDADFGLR NLDLLLGLEQ RIVYTAIDVL    64
IVVTSGKGGV GKTTSSAAIA TGLAQKGKKT VVIDFDIGLR NLDLIMGERR RVVYDFVNVI    64
     ***** ****

NGDCRIDQAL VRDKRWSNFE LLCISKPRSK LPMGFGGKAL EWLVDALKRT PEFSPDFIII   180
EGQCRIDQAL IRDKRWKNLA LLAISKNRQK YNVTT..KNM QNLIDSVK.. .ELGFQFVLI   135
EDECTIDQAL VKDKRLPNLV LLPAAQNRSK DAINAEQMSQ ..LVEQLK.. ..DKFDYIII   118
QGDATLNQAL IKDKRTENLY ILPASQTRDK DADLTREGVA .KVLDDLK.. .AMDFEFIVC   120

DCPAGIDAFG ITAITPANEA VLVTTPDITA LRDADRVTGL LECDGIRDIK               232
DCPAGIDVGF INAIASAQEA VIVTTPEITA IRDADRVAGL LEANGIYNVK               187
DCPAGIEAGF RNAVAPAQEA IIVTTPEMSA VRDADRVIGL LEAEDIGKIS               168
DSPAGIETGF ALMALYFADE AIITTPEVSS VRDSDRILGI LASKSRRAEN GEEPIKEH      178

MIVNRVRTDM IKGEDMMSVL DVQEMLGLSL LGVIPEDSEV IRSTNRGFPL VLNKPPTLAG   292
LLVNRVRPDM IQKNDMMSVR DVQEMLGIPL LGAIPEDTSV IISTNKGEPL VLNKKLTLSG   247
LIVNRLRPEM VQLNQMISVE DILDLLAVPL IGILPDDQKI IISTNKGEPL VMEEKLSVPG   228
LLLTRYNPGR VSRGDMLSME DVLEILTIKL VGVIPEDQSV LRASNQGEPV ILDINA.DAG   237

LAFEQAAWRL .VEQDSMKAV MVEEEPKKRG .FF.SFFGG       Arabidopsis        328
IAFENAARRL IGKQDYFIDL TSPQKGMFQK .LQE.FFLGEE     Chlorella          286
LAFQNIARRL EG.QDIPFLD FMAAHNTLLN RIRRRLLGG       Synnechocystis     266
KAYADTVERL LGEERPFR.. FIEEE.KK.G .FLKRLFGG       E. coli            271
```

FIG. 1

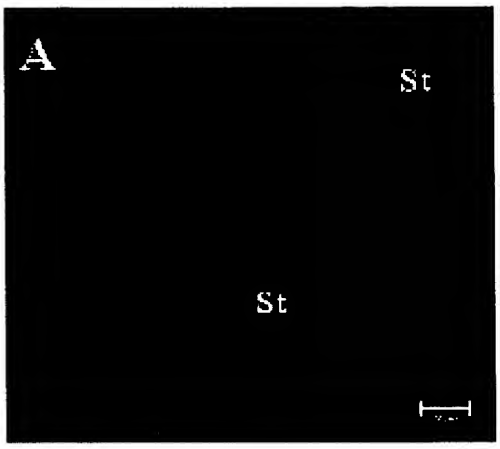


FIG. 2A

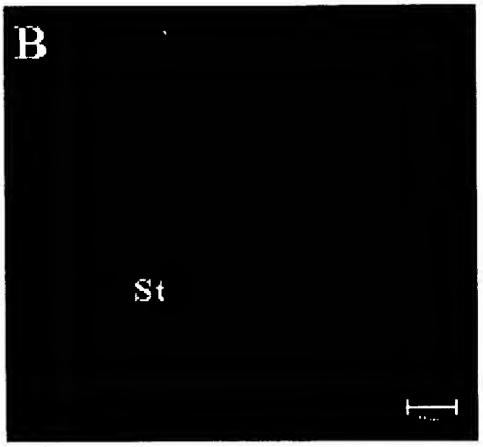


FIG. 2B

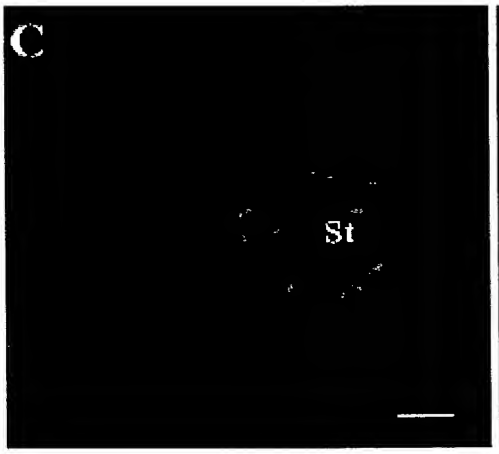


FIG. 2C

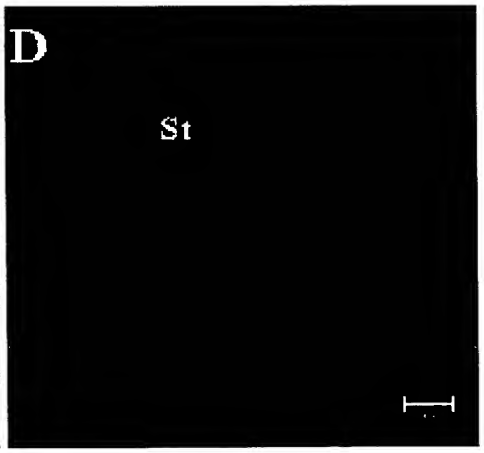


FIG. 2D

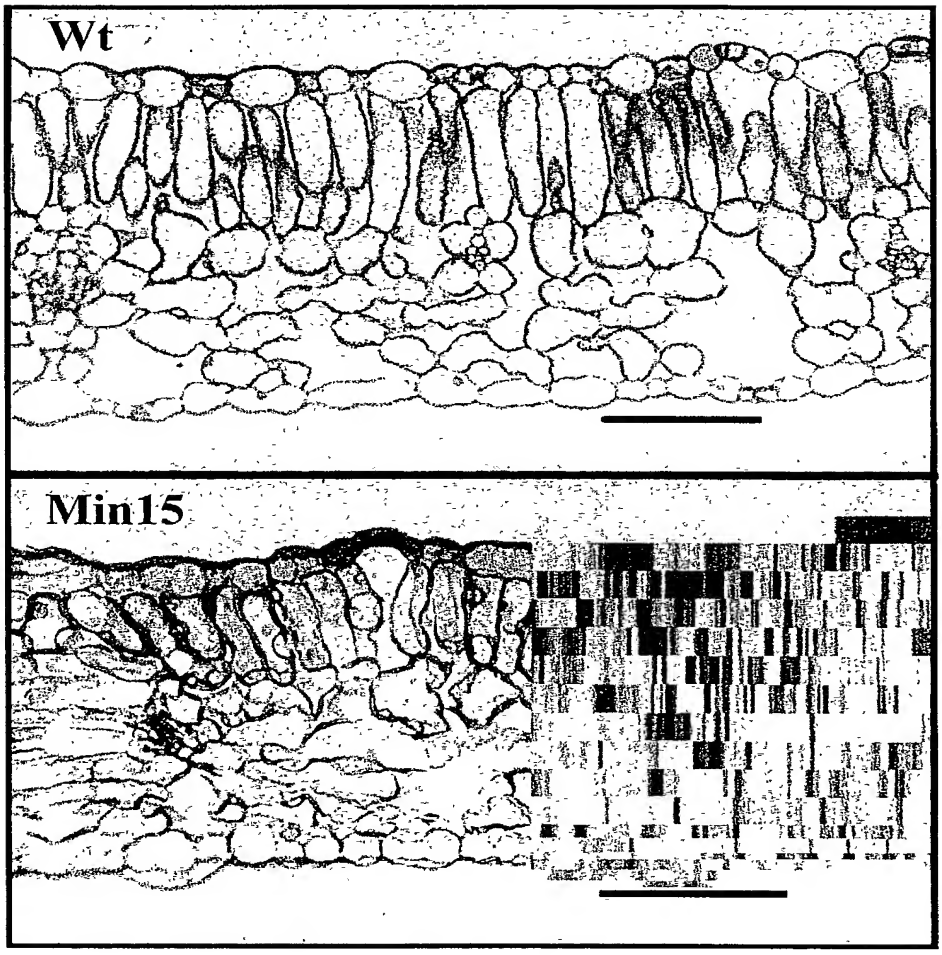


FIG. 3

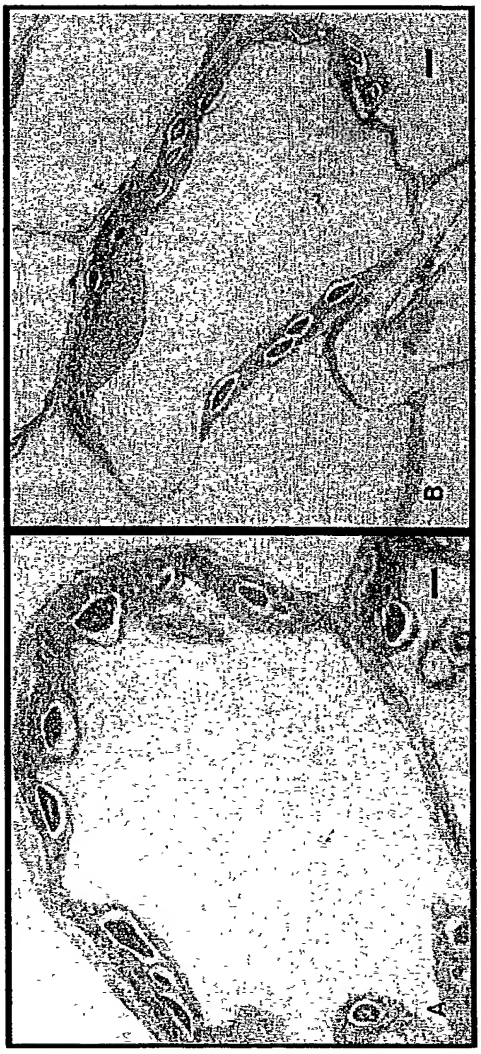


FIG. 4B

FIG. 4A

FIG. 4D

FIG. 4C

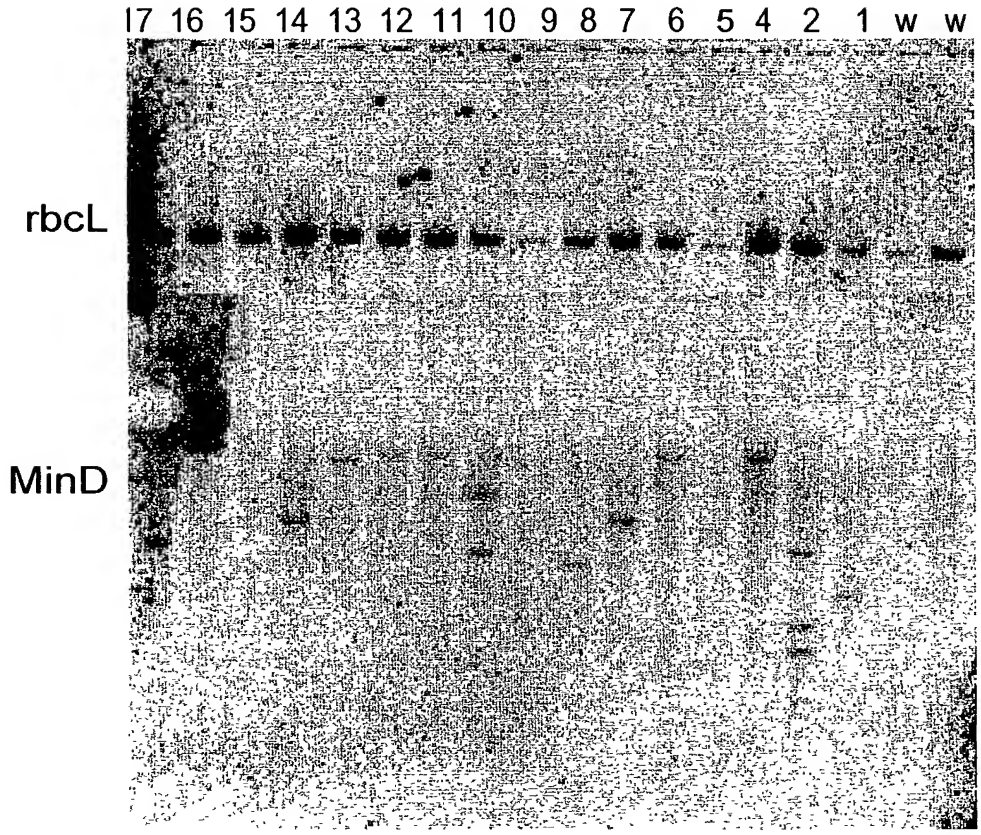


FIG. 5

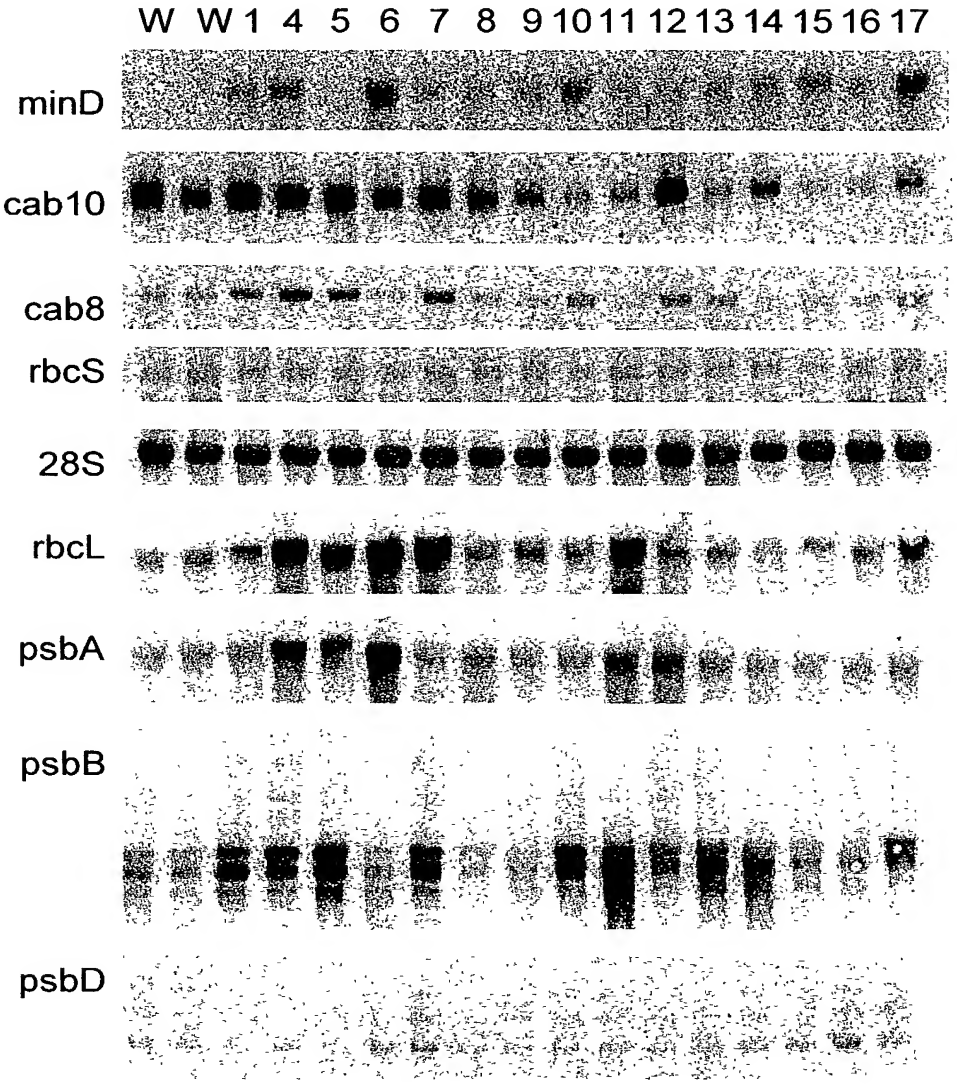

W W 1 4 5 6 7 8 9 10 11 12 13 14 15 16 17
minD
cab10
cab8
rbcS
28S
rbcL
psbA
psbB
psbD

FIG. 6

	Chlorophyll Content		Fluorescence Measurements		
Line	Total Chl (ug/mg)	Chla/b (ratio)	Fo (relative units)	Fm (relative units)	Fv/Fm (relative units)
WT	1.99	3.11	137.4±12.0	616.6±34.0	0.777±0.015
AtMin 4	1.71	2.64	135.7±11.8	636.2±27.1	0.787±0.017
AtMin 5	1.58	3.01	136.5±17.1	534.9±66.1	0.757±0.020
AtMin 8	1.46	3.07	128.5±32.3	489.9±78.6	0.741±0.037
AtMin 9	1.66	3.00	125.5±19.9	520.5±58.3	0.759±0.018
AtMin 10	1.53	2.95	136.5±11.3	543.1±14.3	0.748±0.025
AtMin 17	1.44	2.71	139.5±20.6	564.9±32.7	0.756±0.032
WT	1.69	3.08	105.6±14.9	441.9±58.5	0.760±0.016
AtMin 1	1.74	2.80	126.4±08.6	436.7±27.2	0.714±0.035
AtMin 12	1.60	3.11	123.4±16.6	455.3±84.4	0.724±0.040
AtMin 13	1.91	3.28	115.9±17.9	441.5±64.5	0.737±0.011
AtMin 14	1.59	3.07	113.6±17.2	444.1±58.2	0.743±0.017
AtMin 15	1.59	2.94	119.1±19.5	433.0±45.9	0.724±0.037
AtMin 16	1.71	2.89	122.1±10.7	447.7±41.0	0.725±0.019

The measurements were taken over two days, and due to variation in the F_o and F_M measurements these were kept separate. Fluorescence measurements are averaged from eight samples.

FIG. 7

```
Syne     1                                                                      0
Guill    1                                                                      0
Ecoli    1                                                                      0
Pseudo   1                                                                      0
Neiss    1                                                                      0
Chlorel  1                               MATLLQQGTFAPHRSWSGRKGTRRVSKPTLNRLHVRSSSKAGAGPVSD 48
AtMinE   1   MAMSSGTLRISATLVSPYHHHHRNRLSLPS▼SSSK▼VDFTGFISNGVNSLETQKCTPGLAISRENTRGQVKVLARNTGD 77

Syne     1                        MILELIERLFSRSG---KNSGEDARRRLKLVIANDRSGL--SPEMMEEMRREI 48
Guill    1                        MITEFFERLFLSN----KGSREDVKRRLKLVLAHDRSTL--NASTLEKMREEI 47
Ecoli    1                          MALLDFFLSRK----KNTANIAKERLQIIVAERRRSD-AEPHYLPQLRKDI 46
Pseudo   1                          MSLLDFFRSRKS---QNSASIAKERLQIIVAHERGQR-AQPDYLPQLQKDI 47
Neiss    1                          MSLIELLFGRK----QKTATVARDRLQIIIAQERAQEGQTPDYLPTLRKEL 47
Chlorel  49  AHLAH--LRNAGHPVPEAPGLQGFVAKLKAAWQIFFPEKPPV-LTPKDEGKNRLRMILVADRCGI--TPDSLTGMRESI 122
AtMinE   80  YELSPSPAEQEIESFLYNAINMGFFDRLNLAWKIIFPSHASRRSSNARIAKQRLKMILFSDRCDV--SDEAKRKIVNNI 154

Syne     49  VEVVSRYVEID-PGEMEFSLESD-QRMTALIANLPVRRVR-------------RTKAKSEAQES  97
Guill    48  LLVVSKYVELD-TDSLEFSIRTD-SKMTALIANLPIRRIL-------------KDI         88
Ecoli    47  LEVICKYVQID-PEMVTVQLEQKDGDISILELNVTLPEAE-------------ELK         88
Pseudo   48  LEVIRKYVPID-QEQIQVELENQ-GNCSILELNITLPDR                          84
Neiss    48  MEVLSKYVNVS-LDNIRISQEKQDG-MDVLELNITLPEQK-------------KV          87
Chlorel  123 VQAVSAYVDIETEEEIEVNLSTDPELGTIYSVAVPVRRVKSRRIGGVDTSEDGKIIVKWDPKDPNSDPSDQFPFGV 198
AtMinE   157 IHALSDFVEIESEEKVQLNVSTDGDLGTIYSVTVPVRRVKP-EYQDVDEAGTITNVEYKDTRDGSVDVRFDFYVPE 229
```

FIG. 8

FIG. 9A

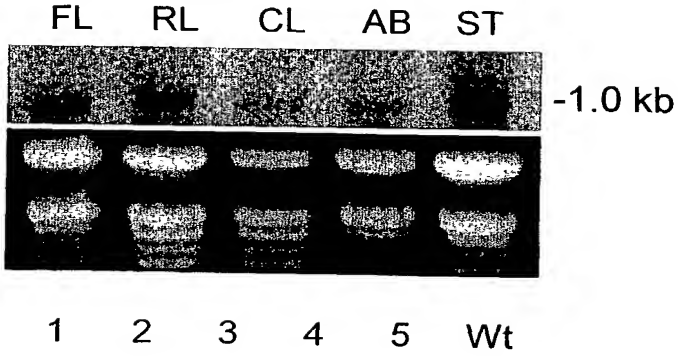


FIG. 9B

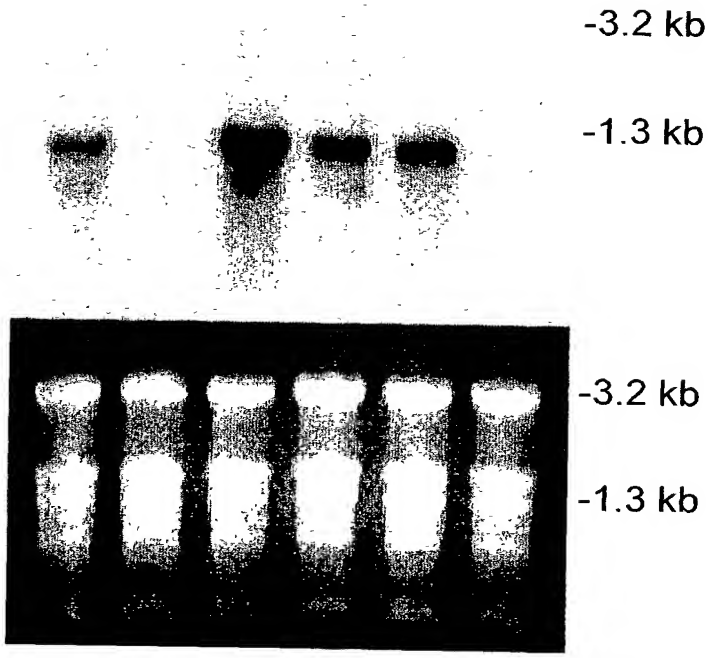
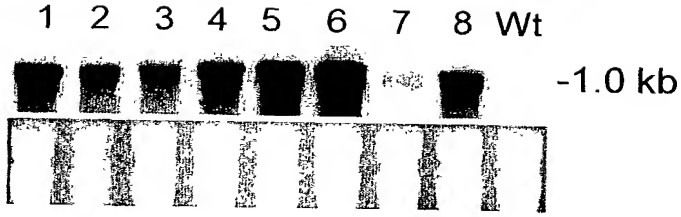


FIG. 9C



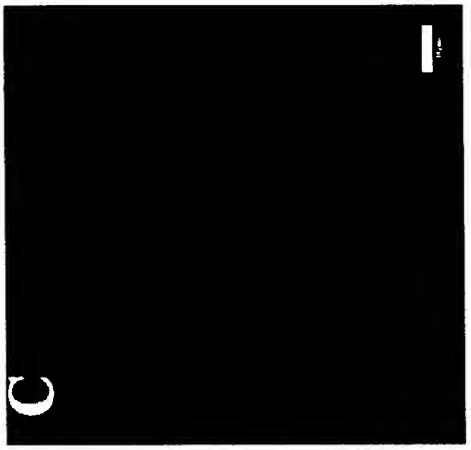


FIG. 10C

FIG. 10B

FIG. 10A

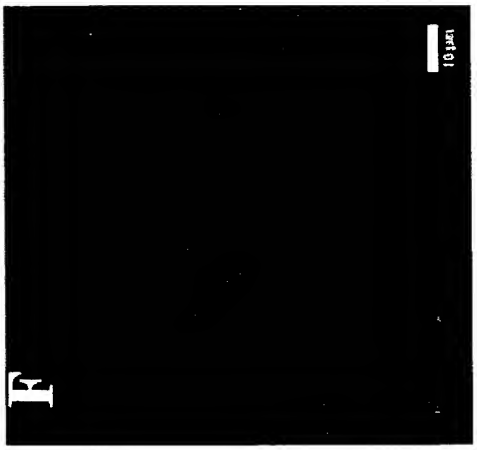


FIG. 10F

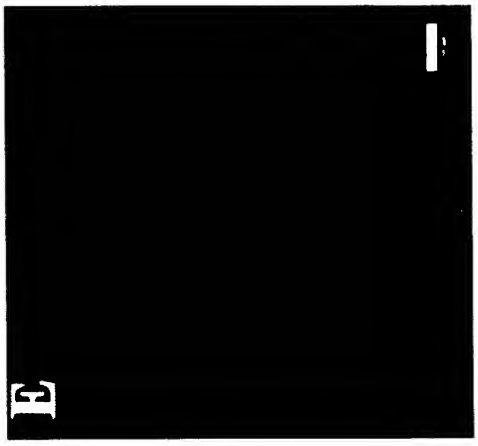


FIG. 10E

FIG. 10D

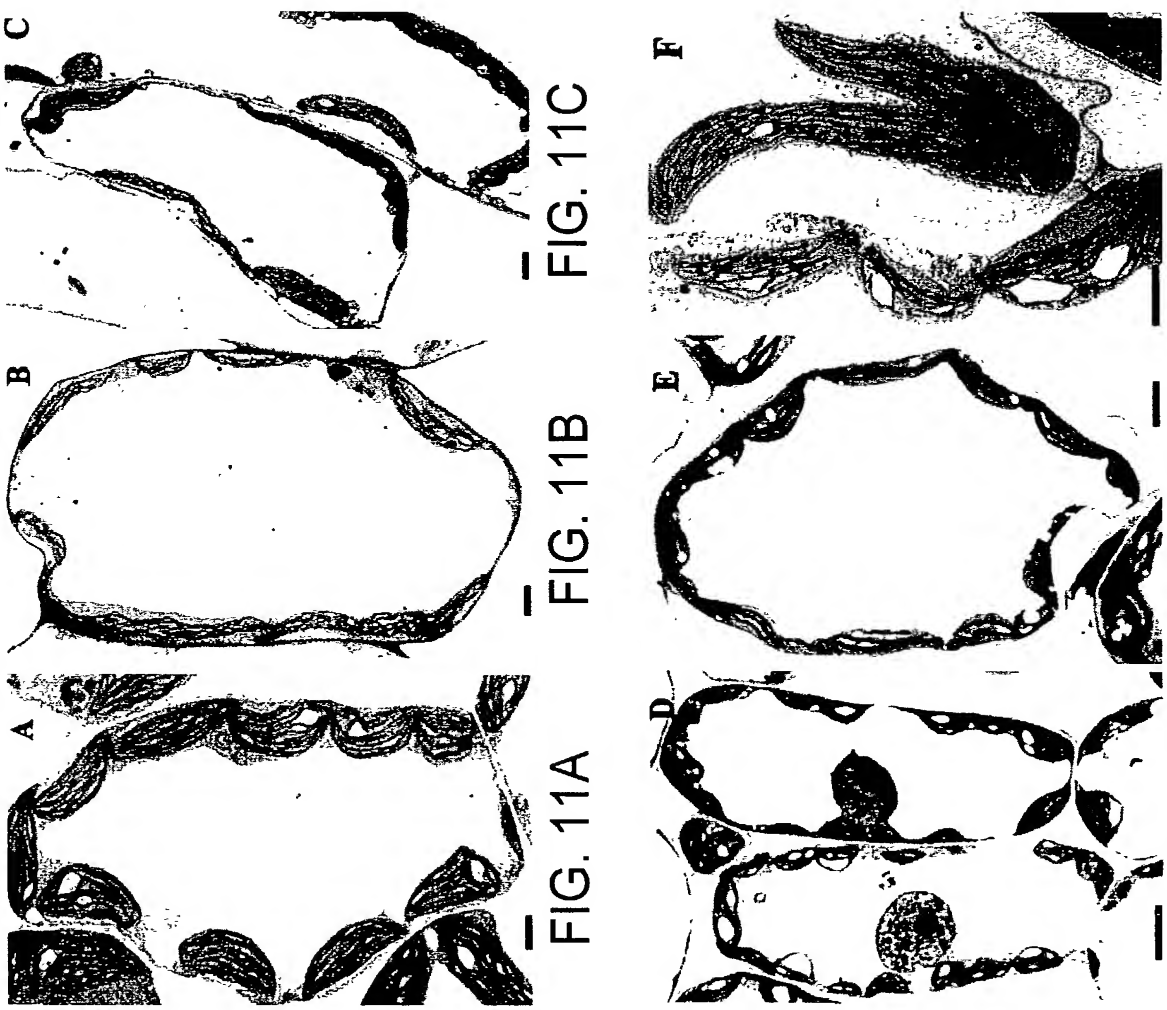


FIG. 11A FIG. 11B FIG. 11C

FIG. 11D FIG. 11E FIG. 11F

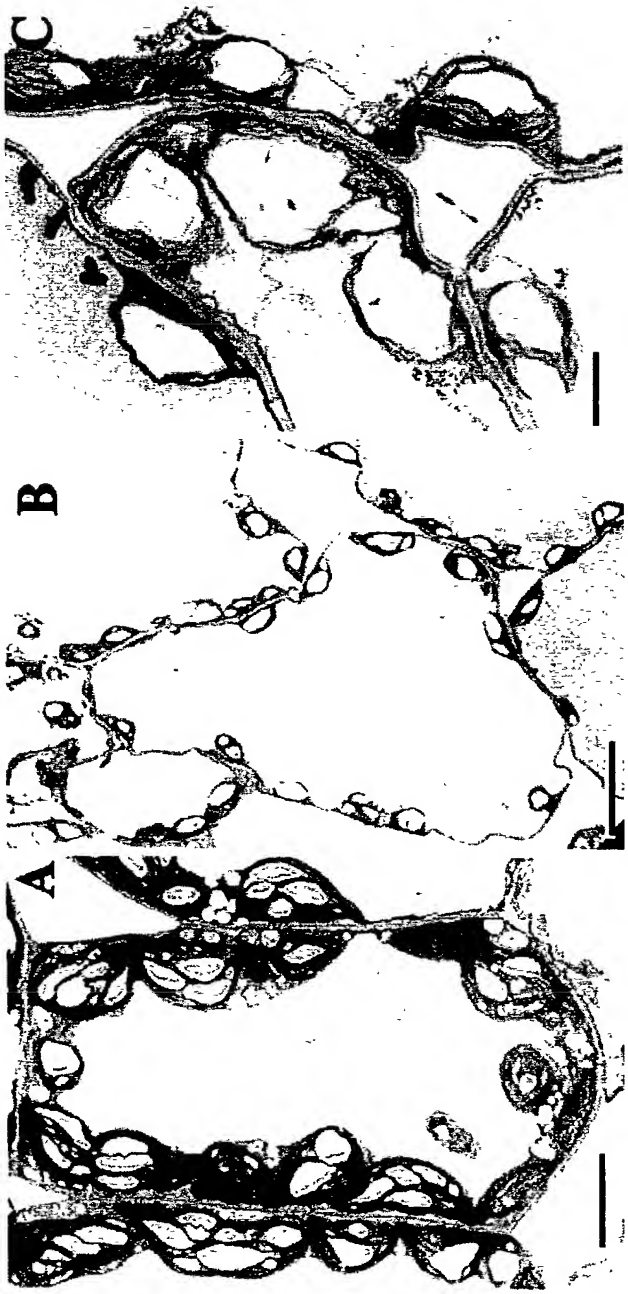


FIG. 12C

FIG. 12B

FIG. 12A

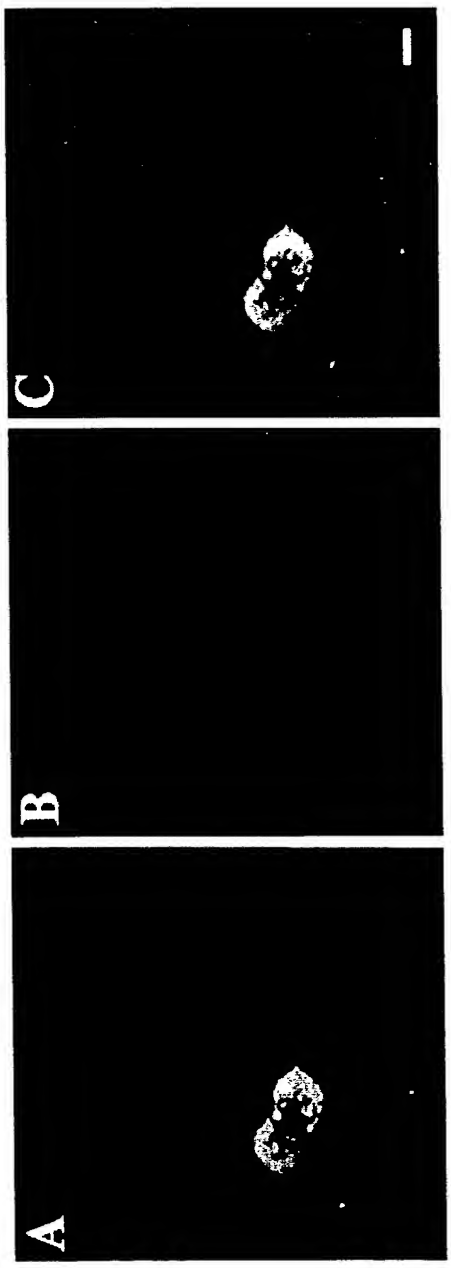


FIG. 13A

FIG. 13B

FIG. 13C

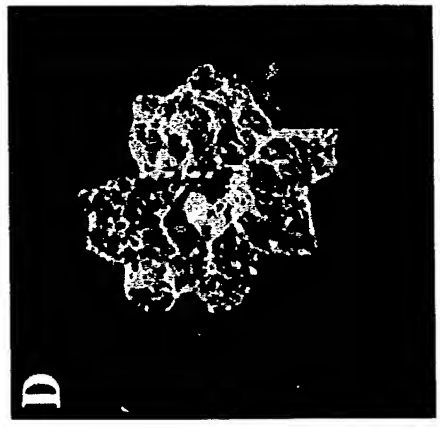


FIG. 13D

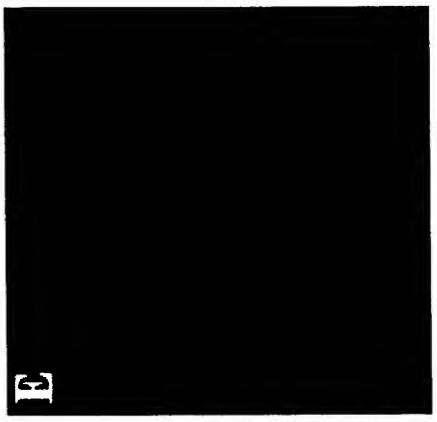


FIG. 13E

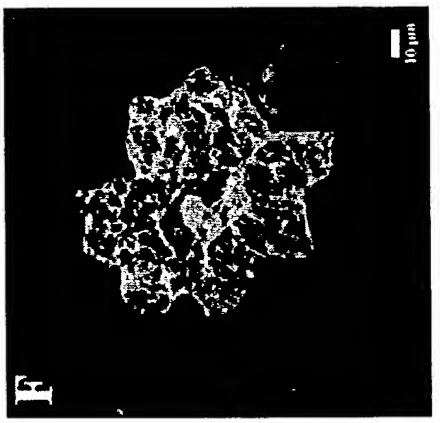


FIG. 13F